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Research Note

Coccidian Parasites of Heteromyid and Murid Rodents from Baja California del Sur, Mexico

CHRIS T. MCALLISTER,[1] STEVE J. UPTON,[2] ROBERT R. HOLLANDER,[3] AND KELLY M. HOGAN[4]

[1] Renal-Metabolic Lab (151-G), Department of Veterans Affairs Medical Center, 4500 S. Lancaster Road, Dallas, Texas 75216,
[2] Division of Biology, Ackert Hall, Kansas State University, Manhattan, Kansas 66506,
[3] Department of Biological Sciences, Central Connecticut State University, New Britain, Connecticut 06050, and
[4] Department of Biology, Texas A&M University, College Station, Texas 77843

ABSTRACT: Thirty-one heteromyid and murid rodents were collected from 3 sites in Baja California del Sur, Mexico, and their feces examined for coccidia. Of the 31 rodents examined, 10 (32%) were found to be harboring 1 of 3 eimerians. Infected hosts included 2 of 7 *Peromyscus eva eva* (Muridae) with *Eimeria arizonensis* and 1 of 7 *P. e. eva* with *Eimeria langebarteli*; and 3 of 6 *Chaetodipus baileyi extimus* (Heteromyidae), 2 of 8 *Chaetodipus spinatus broccus,* and 2 of 3 *C. s. peninsulae* with *Eimeria reedi.* This note documents new host and distribution records for *Eimeria* species from murid and heteromyid rodents in Baja California del Sur, Mexico.

KEY WORDS: Rodentia, Heteromyidae, Muridae, *Eimeria arizonensis, Eimeria langebarteli, Eimeria reedi,* survey, Baja California del Sur, Mexico.

Much has been published on coccidian parasites of rodents (see Levine and Ivens, 1990), particularly those belonging to the family Heteromyidae (Doran and Jahn, 1949, 1952; Doran, 1953; Levine et al., 1957, 1958; Ivens et al., 1959; Ernst et al., 1967a, b, 1968, 1970; Short et al., 1980; Stout and Duszynski, 1983; Hill and Best, 1985; Ford et al., 1990). Although some information is available on coccidia of heteromyids from Baja California Norte, Mexico (Stout and Duszynski, 1983; Ford et al., 1990), nothing, to our knowledge, has been written on coccidians from rodents of Baja California del Sur, Mexico. Here, we report new host and distributional records for *Eimeria* species in heteromyid and murid rodents from that region.

During January 1992, 31 rodents, including 9 murids and 22 heteromyids, were collected by 2 of us (R.R.H. and K.M.H.) from 3 localities in Baja California del Sur, Mexico (Table 1), and their feces examined for coccidia. General habitat of the area is desert shrub and creosote bush (*Larrea* sp.) or the lower Sonoran life zone of Merriam (cited *in* Odum, 1945). Mice were collected with Sherman live traps and killed by cervical dislocation. Feces from the rectum were placed in individual vials of 2.5% (w/v) aqueous potassium dichromate ($K_2Cr_2O_7$) and stored on ice. On return to the United States, samples were mailed to the VA Medical Center–Dallas, where unsporulated oocysts were sporulated at room temperature (ca. 22°C) in Petri dishes in a thin layer of $K_2Cr_2O_7$. Sporulated oocysts were concentrated by centrifugation in Sheather's sugar solution (sp. gr. 1.30) and examined microscopically. Measurements were made on up to 30 oocysts of each species and compared to previously published descriptions. Voucher specimens of hosts are on deposit in the Museum, Texas Tech University, and the Texas Cooperative Wildlife Collection, Texas A&M University.

Of the 31 rodents examined, 10 (32%) were found to be passing oocysts of 1 of 3 eimerians (Table 1); all infected hosts harbored a single species of *Eimeria.* Although our sample size is modest, prevalence of infection compares favorably to data provided by Ford et al. (1990), who reported 84 of 223 (38%) heteromyids infected with 11 species of eimerians from the southwestern United States, Baja California Norte, and Sonora, Mexico.

Eimeria arizonensis Levine, Ivens, and Kruidenier, 1957, appears to be one of the most ubiquitous coccidians in North American murid rodents. It has been reported previously from Piñon mice, *Peromyscus truei* (Shufeldt, 1885), in Arizona (Levine et al., 1957) and New Mexico (Reduker et al., 1985, 1987; Wash et al., 1990; Upton et al., 1992); white-footed mice, *Peromyscus leucopus* (Rafinesque, 1818), in Illinois (Levine and Ivens, 1960) and Texas (Upton et al., 1992); deer mice, *Peromyscus maniculatus* (Wagner,

Table 1. Rodents surveyed for coccidia from Baja California del Sur, Mexico, and the eimerian species collected.

Rodents	Locality*	Prevalence	Coccidian
Muridae			
Peromyscus eva eva	1	2/7	*Eimeria arizonensis*
	1	1/7	*E. langebarteli*
Neotoma lepida pretiosa	1	0/2	—
Heteromyidae			
Chaetodipus baileyi extimus	1	3/5	*E. reedi*
	2	0/1	—
C. dalquesti	3	0/3	—
C. spinatus broccus	1	2/8	*E. reedi*
C. s. peninsulae	3	2/3	*E. reedi*
Dipodomys merriami melanurus	2	0/2	—

* Localities: 1 = El Juncalito; 2 = 9.7 km S, 17.7 km W La Paz; 3 = Migriño, 25.7 km NW Cabo San Lucas.

1845), in British Columbia (Levine and Ivens, 1963), Illinois (Levine and Ivens, 1960), and New Mexico (Reduker et al., 1987); cactus mice, *Peromyscus eremicus* (Baird, 1858), in New Mexico (Reduker et al., 1987); canyon mice, *Peromyscus crinitis* (Merriam, 1891), in Utah (McAllister et al., 1991); northern rock mice, *Peromyscus nasutus* (J. A. Allen, 1891), in Texas (McAllister et al., 1991); brush mice, *Peromyscus boylii* (Baird, 1855), in New Mexico (Wash et al., 1990); and fulvous harvest mice, *Reithrodontomys fulvescens* J. A. Allen, 1894, and plains harvest mice, *Reithrodontomys montanus* Baird, 1855, in Texas (Upton et al., 1992). As noted recently by Upton et al. (1992), the report by Ford et al. (1990) of *E. arizonensis* in California pocket mice, *Chaetodipus californicus* Merriam, 1899, from Baja California Norte, Mexico, and Texas kangaroo mice, *Dipodomys elator* Merriam, 1894, from Texas, may be a misidentification. Our finding of sporulated oocysts that we could not distinguish from published descriptions of *E. arizonensis* in Eva's desert mice, *Peromyscus eva eva* Thomas, 1898, from Baja California del Sur, Mexico, is not surprising; however, it represents a new host and distributional record for the coccidian.

Eimeria langebarteli Ivens, Kruidenier, and Levine, 1959, was originally described from *P. boylii* in Chihuahua, Mexico (Ivens et al., 1959). It has since been reported from *P. leucopus* and *P. truei* from California (Reduker et al., 1985) and hispid pocket mice, *Chaetodipus hispidis* Baird, 1858, from Texas (Ford et al., 1990). In addition, Upton et al. (1992) suggested that the report of *Eimeria taylori* McAllister and Upton, 1988, in *P. leucopus* from Texas (McAllister and Upton, 1992) was a misidentification and probably represented the morphologically similar *E. langebarteli.* In the present survey, sporulated oocysts that were structurally identical to those of *E. langebarteli* were found in a new host, *P. eva eva.* Baja California del Sur, Mexico, is also a new locality for the coccidian.

Eimeria reedi Ernst, Oaks, and Sampson, 1970, is a common eimerian of heteromyid rodents. The species was originally reported from long-tailed pocket mice, *Chaetodipus formosus* Merriam, 1889, from California (Ernst et al., 1970; Ford et al., 1990) as well as *C. californicus* and desert pocket mice, *Chaetodipus penicillatus* Woodhouse, 1852, from California and Baja California Norte, Mexico, San Diego pocket mice, *Chaetodipus fallax* Merriam, 1889, and spiny pocket mice, *Chaetodipus spinatus* Merriam, 1889, from Baja California Norte, Mexico, *C. hispidis* from Texas, and silky pocket mice, *Perognathus flavus* Baird, 1855, from New Mexico and Texas (Ford et al., 1990). The sporulated oocysts we observed from the new hosts, Bailey's pocket mice, *Chaetodipus baileyi extimus* Nelson and Goldman, 1930, and 2 subspecies of spiny pocket mice, *Chaetodipus spinatus broccus* Huey, 1960, and *C. s. peninsulae* Merriam, 1894, were indistinguishable from those in the preceding descriptions. In addition, this is the first time the coccidian has been reported from Baja California del Sur, Mexico.

In summary, new host and distributional records are reported for 3 rodent eimerians from murid and heteromyid rodents from Baja California del Sur, Mexico. Given the hostile environment and desert extreme in which the rodents and their coccidian oocysts occur (<25 cm pre-

cipitation/yr), we did not expect to find a third of the hosts infected. However, data are similar to those reported by Ford et al. (1990), who reported a moderate prevalence of infection for western rodents inhabiting arid environments.

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